REMARKS

The application includes claims 1-27 and 44 prior to entering this amendment.

The application remains with claims 1-27 and 44 after entering this amendment.

The applicants do not add new matter and request reconsideration.

Claim Rejections - 35 U.S.C. § 112

The Examiner rejected claims 13-17 under 35 U.S.C. § 112, second paragraph. Claims 13-17 have been amended as suggested by the Examiner. Accordingly, claims 13-17 are allowable under 35 U.S.C. § 112. Since there are no other rejections related to claims 13 and 14, claims 13 and 14 are now in condition for allowance. Claim 44 has been amended to include at least some of the elements in claim 13. Therefore, claim 44 is also allowable for at least some of the same reasons as claim 13.

Claim Rejections - 35 U.S.C. § 102

The Examiner rejected claims 1-3, 5-7, 11-12, 19, and 22 under 35 U.S.C. § 102(b) as being anticipated by Hietanen. The rejection is respectfully traversed. However, claim 1 has been amended and now recites:

an analog signal processor . . . comprising a bridge circuit configured to provide a first echo cancellation operation and including a transducer configured to convert the reception signal at the first analog input into acoustic wave vibrations in the ear canal and further configured to convert acoustic wave vibrations received from the ear canal into the transmission signal at the second analog output; and

a digital signal processor (DSP) . . . configured to use the measured operating characteristics to provide a second echo cancellation operation to filter reception signal echo from the transmission signal not filtered by the first echo cancellation operation provided by the analog signal processor.

Hietanen does not disclose an analog signal processor comprising a bridge circuit configured to provide a first echo cancellation operation and a DSP that provides a second echo cancellation operation as recited in claim 1. Refer to FIG. 4 of Hietanen where there is no echo cancellation provided in the analog circuitry in the earphone unit 11.

The Examiner has cited Schultz as disclosing a transducer 1310. However, Schultz never mentions echo cancellation, much less, echo cancellation by the transducer 1310.

For at least these reasons, claim 1 is patentable under 35 U.S.C. § 102(b) over Hietanen.

Claim 19 has been amended and now recites:

configuring a first filter in the digital signal processor to simulate an input voltage generated by the analog signal processor with a large amplitude;

configuring a second filter in the digital signal processor to simulate an input voltage generated by the analog signal processor having a small amplitude. . .

Heitanen derives one transfer function for the audio path between the ear capsule 12 and microphone capsule 13 (FIG. 6; col. 5, lines 27-col. 6, lines 8). Fang generates a first training filter Ai(Z) that models a static portion of a feedback path and a second tracking filter Bi(Z) that tracks variations of the feedback path causes by jaw movement (col. 3, lines 56-col. 4, lines 13). However, neither Heitanen or Fang configure first and second filters to simulate large and small amplitude input voltages generated by an analog signal processor as recited in claim 19.

Therefore, claim 19 is also patentable under 35 U.S.C. § 102(b) over Hietanen. Claim 25 includes at least some elements similar to claim 19 and is therefore patentable for at least some of the same reasons.

The Examiner rejected claims 4, 8-10, 20, 21, 23-24, and 26-27 under 35 U.S.C. § 103(a) as being unpatentable over Hietanen as applied to claim 1 above, and further in view of Fang. The Examiner rejected claims 15-18, and 2 under 35 U.S.C. § 103(a) as being unpatentable over Hietanen in view of Fang and Schultz.

Claim 23 has been amended and now recites:

transmitting a first test signal through a first signal path in the analog signal processor;

generating a first set of filter coefficients from the first test signal that simulate signal transmission characteristics through the first signal path;

transmitting a second test signal through a second signal path in the analog signal processor;

generating a second set of filter coefficients from the second test signal that simulate signal transmission characteristics through the second signal path;

combining the first set of coefficients with the second set of coefficients in a first filter in the digital signal processor to simulate a large amplitude signal response of the first signal path and a the second signal path through the analog signal processor;

transmitting a third test signal through the first signal path and through a third signal path that includes the first filter and the second signal path;

generating a third set of coefficients from the third test signal;

using the third set of coefficients in a second filter located in the digital signal processor to simulate a small amplitude signal response of the analog signal processor;

transmitting a receive signal through the first signal path and the third signal path; and

subtracting an output of the second filter from an output of the analog signal processor to substantially cancel an echo component present in the output of the analog signal processor.

Neither Hietanen, Fang or Schultz suggest transmitting test signals through a first, second, and third signal path and generating first, second, and third sets of coefficients, respectively, as recited in claim 23. As explained above, Heitanen only derives one transfer function between the ear capsule 12 and microphone capsule 13 (FIG. 6; col. 5, lines 27-col. 6, lines 8). Fang only derives a first training filter Ai(Z) and a second tracking filter Bi(Z) through a same feedback path, not three different sets of coefficients each associated different signal paths as recited in claim 23 (col. 3, lines 56-col. 4, lines 13).

Therefore, claim 23 is patentable under 35 U.S.C. § 103(a) over Hietanen in view of Fang.

Claim 2 recites:

wherein the bridge circuit further comprises:

a first node coupled to the first analog input of the analog signal processor and coupled to a first end of a first resistor;

a second node coupled to a first end of the transducer, a second end of the first resister, and the first input of a differential amplifier; and

a third node coupled to a second end of the transducer through a second resistor and coupled to the first input of the differential amplifier.

The Examiner acknowledges that Heitanen does not describe a bridge circuit, but alleges that a bridge circuit is disclosed by the transducer 1320 in Schultz. However, the transducer 1320 shown in Schultz does not show a transducer coupled between a second and third node as recited in claim 2. Further, two of the nodes in Schultz are connected to Vcc and ground (see FIG. 21A). Thus, the transducer 1320 in Schultz cannot have the first, second and third nodes as recited in claim 2.

Claim 4 further recites *a first resistor-capacitor filter coupled between the first and third nodes and a second resistor-capacitor filter coupled between the second and third nodes.*

There are no filters used in the transducer 1320 of Schultz, much less, *a first resistor-capacitor filter coupled between the first and third nodes and a second resistor-capacitor filter coupled between the second and third nodes* as recited in claim 4.

For at least these reasons, claims 2 and 4 are separately patentable under 35 U.S.C. § 102(b) over Hietanen and also patentable under 35 U.S.C. § 103(a) over Hietanen in view of Fang and Schultz.

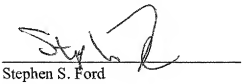
CONCLUSION

For the foregoing reasons, the applicants request reconsideration and allowance of claims 1-27 and 44. The applicants encourage the Examiner to telephone the undersigned if it appears that an interview would be helpful in advancing the case.

Customer No. 73552

Respectfully submitted,

STOLOWITZ FORD COWGER LLP



Stephen S. Ford
Reg. No. 35,139

STOLOWITZ FORD COWGER LLP
621 SW Morrison Street, Suite 600
Portland, OR 97205
(503) 224-2170